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A CUTHONID, *CUTHONA ALPHA* N. SP., WITH A RADULA OF *CATRIONA* TYPE (NUDIBRANCHIA-EOLIDOIDEA)[1]

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With Plate XI

Efforts appear to have been made by various authors (ODHNER, 1939, p. 53; MACNAE, 1954a, pp. 3–4, 1954b, pp. 52–53; MARCUS, 1959, pp. 917–918) in order to distinguish generically *Catriona* WINCKWORTH, 1941 (=*Cratena* in older use) from *Cuthona* ALDER & HANCOCK, 1855. To summarize the present knowledge of ours concerning the distinctions between the two genera:

Cuthona ···Radula teeth with a projecting median cusp; penis unarmed.

Catriona···Radula teeth with a median cusp retracted or similar to lateral denticles in length; penis armed with an apical stylet.

It is to be regretted that the type species of *Cuthona* (*nana* A. & H., 1842, Atlantic) is still left more or less uncertain in its internal structure.

This paper is intended to call attention to the occurrence of a mosaic[2] species which has the decided radula type[3] of *Catriona* (cf. the radula teeth of *aurantia* A. & H., 1842, Atlantic) on one hand, and the presumed penis peculiarity[4] of *Cuthona* (cf. the penis of *pustulata* A. & H., 1854, by ODHNER, 1939, p. 72, fig. 33, Atlantic) on the other hand. Here a tentative reference of our species[5] is made to *Cuthona* following to MARCUS, 1959, p. 917.

We take this opportunity of thanking Mr. Takeo ABE of the Takaoka Senior High School, Toyama Pref., for allowing us to discuss on the paratype specimens in his collection.

1) Contributions from the Tamano Marine Laboratory, No. 108.

2) Another problematical species was found by the senior author and Mr. Takeo ABE; it showed the *Cuthona* teeth and the *Catriona* penis. The description will appear in the Annual Report of the Noto Marine Laboratory (Faculty of Science, University of Kanazawa), vol. 4, 1964.

3, 4) See the suggestion made by RISSO-DOMINGUEZ, 1962, pp. 145–152, on the systematic meaning of the radula teeth and penis armatures in the classification of the Facelinidae.

5) See also BABA, 1963, p. 109 (*Cuthona futairo*).

Cuthona alpha BABA & HAMATANI, n. sp.

Kozuchi-minoumiushi (n. n.)

? *Amphorina* sp. ELIOT, 1913, p. 43.—Misaki.

This species is readily recognized externally by the vivid orange colour of the cephalic tentacles and rhinophores (this orange colouring may be absent either on the cephalic tentacles or on the rhinophores according to different specimens), and internally by the possession of an exceedingly elongated radula ribbon.

Holotype: Matured, length 13 mm (Code Ac of RISSO-DOMINGUEZ, 1963). Head broad as shown in *Cuthona nana*. Simple rhinophores. Rounded foot-corners. Branchial papillae long fusiform, and arranged in 9 simple oblique rows on each side. Genital orifices between and below the 1st and 2nd rows on the right side, the anus in front of the inner corner of the post-anal row, the nephroproct preanal. General body-colour translucent yellowish white covered thickly with opaque white dots on the head region in the middle line, on the cephalic tentacles and rhinophores, and on nearly the whole length of the branchial papillae, on their outer surface. Both the cephalic tentacles and rhinophores tinged with vivid orange. Liver-diverticula within the branchial papillae yellowish brown. Liver branching as usual in *Cuthona* (and *Catriona*), the right liver and the left-sided partner containing 4 simple canals. Blind-sac of stomach not determined. Simple salivary glands. Oral glands as in *Catriona*. Simply elongated kidney. Jaw-edge (?). Radula colourless, the formula about 80×0.1.0. Median cusp of the teeth retracted (*Catriona* type), lateral denticles 2–3 one each side, these latters often seen interspersed by smaller ones among them. Penis elongated conical, muscular, and not armed with a stylet (*Cuthona* type). A penis gland attached to the base of the penis. About 7 testes, each accompanied by several ovaries.

Holotype locality: On the shore of Kozuchi-jima near the Tamano Marine Laboratory, Tamano, Inland Sea of Seto, Japan.
Date of collection: Apr. 21, 1962 (1 sp., coll. by the authors).

The holotype was prepared in serial horizontal sections.

Paratype: Matured, length 15 mm (Code Acm). Branchial papillae rather thickly set in 14 simple oblique rows on each side, about 5–6 papillae in the largest rows, the foremost 5 rows belonging to the right liver (and the left-sided partner). Anus and nephroproct as in the holotype. Genital orifices between and below the 2nd and 3rd rows on the right side. General body-colour slightly yellowish white; the rhinophores orange (and each with a longitudinal opaque white line hidden by the predominating orange colour), the cephalic tentacles colourless except for a longitudinal streak of opaque white running from their bases to the tips; branchial papillae with an outer, longitudinal, opaque-white

line, their veins (=liver-diverticula) reddish. Radula formula 80×0.1.0. Characters of the teeth and the penis exactly as in the holotype.

Paratype locality: On the shore of Abugashima, Toyama Bay, Japan Sea side of Japan.
Date of collection: Apr. 29, 1951 (1 sp., coll. by Mr. ABE and the senior author).

Until now a series of additional paratype specimens of this new species have been obtained by Mr. ABE from the first paratype locality. Among them there is a slight variation in colours ranging from the coloration of the holotype to that of the first paratype. The longest radula ribbon taken from them may be represented by the formula 105×0.1.0. In one of the paratype specimens there was a row of (about 20) denticles on the jaw-edge.

Synopsis of the family Cuthonidae

A tentative synopsis of the genera of the family Cuthonidae is here prepared, partly as a result of our actual dissection work on some of the cuthonid eolids collected from our seas, and partly as a summary of the bibliographical records referred to during this study. As for the main principle of classification of this family, we adopted that of ODHNER, 1939.

Family Cuthonidae ODHNER, 1939.

Acleioprocta with the anus (and preanal nephroproct) lying between the right liver and the left posterior liver branches (in the interhepatic space). Radula uniseriate (0.1.0) (ODHNER, 1939, pp. 52–53, shortened).

A. Cuthoninae (ODHNER, 1939).

Typical cuthonids. Branchial papillae in many oblique rows (ODHNER, 1939, p. 52). Usually having more than 3 canals in the right liver (and the left-sided partner). Some aberrant forms each with a reduced liver system (and hence simplified papillation) may occur within the scope of this subfamily. Genera: *Cuthona*[1] A. & H., 1855; *Catriona*[2] WINCKWORTH, 1941 (=*Trinchesia* PRUVOT-FOL, 1951); *Subcuthona* BABA, 1949 (aberrant); *Tenellia* A. COSTA, 1866 (aberrant). Further accounts of the internal anatomy are to be expected for the genera: *Precuthona, Cuthonella, Cratenopsis, Indocratena, Xenocratena, Diaphoreolis, Noumeaella, Globiferina, Ennoia, Narraeolidia* (?=*Cuthona*), *Dunga, Zatteria, Njurja, Phestilla,* and *Guyvalvoria.*

B. Tergipedinae ODHNER, 1939.

Liver system extremely simplified with only 1 canal in the right liver (and the left-sided partner) (ODHNER, 1939, p. 75; PRUVOT-FOL, 1954, p. 378; slightly

1, 2) Neglecting some minor differences found in connection with the radula teeth and penis armature, the genera *Cuthona* and *Catriona* agree with each other quite well in the general organization both external and internal. They may finally be collected into a single morphological group.

altered). Genera: *Tergipes* CUVIER, 1805; ?*Piseinotecus* MARCUS, 1955; ?*Myja* BERGH, 1896.

C. ?Embletoninae PRUVOT-FOL, 1954.

Head with paired oral lobes. Having 2 canals in the right liver (and the left-sided partner); a single branchial papilla to each liver canal. Genus: *Embletonia* A. & H., 1851.

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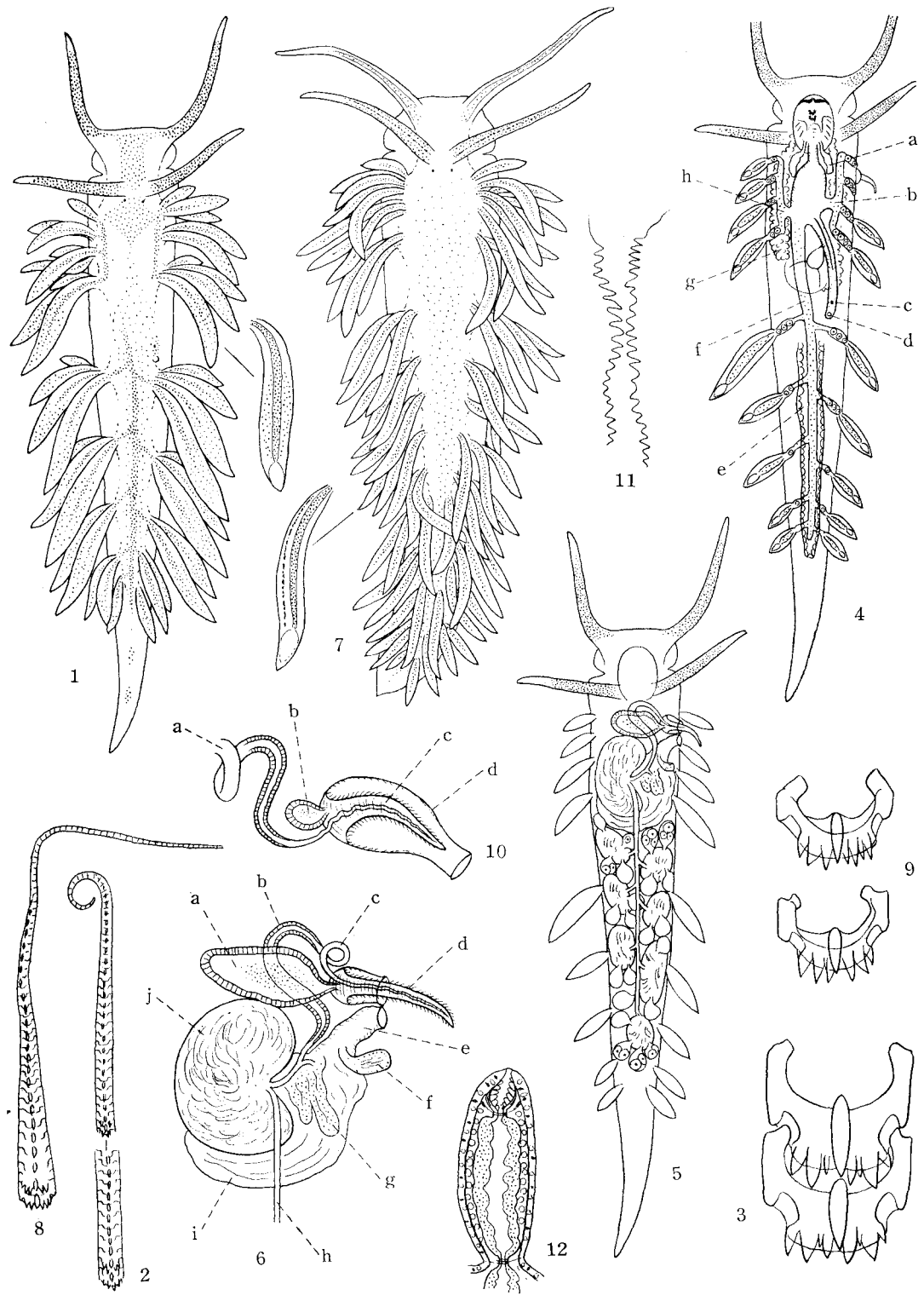
EXPLANATION OF PLATE XI

Figs. 1–6. *Cuthona alpha* from Tamano, Inland Sea of Seto (Apr. 21, 1962), holotype;
Figs. 7–10. The same species from Abugashima, Toyama Bay (Apr. 29, 1951), paratype;
Fig. 11. The same species from the first paratype locality (May 3, 1955);
Fig. 12. The same species from the first paratype locality (Apr. 29, 1961).
Fig. 1. Holotype, entire animal in life (length 13 mm).
Fig. 2. Entire radula ribbon.
Fig. 3. Radula teeth (×300).
Fig. 4. Digestive system in the body, diagrammatic. a. salivary gland, b. right liver, c. nephroproct, d. anus, e. kidney, f. left posterior liver, g. oral gland, h. left anterior liver.
Fig. 5. Genital system in the body, diagrammatic.
Fig. 6. Genital organs from above, diagrammatic. a. penis gland, b. prostatic part of vas deferens, c. muscular part of vas deferens, d. penis, e. outer oviduct, f. spermatheca, g. albumen gland, h. hermaphrodite duct, i. mucous gland, j. ampulla.
Fig. 7. Paratype, entire animal in life (length 15 mm).
Fig. 8. Entire radula ribbon.
Fig. 9. Radula teeth (×200).
Fig. 10. Part of male genital organ. a. prostatic part of vas deferens, b. penis gland, c. penis, d. penis sheath.
Fig. 11. Denticulations of the jaw-edge (×200).
Fig. 12. Branchial papilla with an artificial cnidopore (×25).



K. BABA AND I. HAMATANI: *A CUTHONID*, CUTHONA ALPHA *N. SP.*